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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

A SCIENCE SERVICE PUBLICATION

UNIV OF MICHIGAN
THE OBSERVATORY
ANN ARBOR, MICH

IT'S "LOADED" WITH BETTER TELEPHONE SERVICE

Twenty of the Bell System's newest small loading coils—like the one at the left—are housed in the long black case, mounted in a cable splice. This type of installation permits the economical extension of city cables to serve out-of-town subscribers.

MANY more wires can be crowded into a cable sheath when the wires are fine. But normally, wires don't transmit as well when they are fine and closely packed.

Bell engineers long ago learned to make wires do better work by loading them with inductance coils at regular intervals. The coils improve transmission and let messages travel farther. But originally the coils themselves were large, heavy and expensive. The cases to hold them were cumbersome and costly too.

So year after year Bell scientists squeezed the size out of coils. To make magnetic cores of high permeability they developed Permalloy. Tough but extra-thin insulation permitted more turns to a core.

New winding machines were developed by the Western Electric Company. Coil size shrunk to one-fiftieth. Some—like the one shown above—can be mounted right in cables themselves.

The 15,000,000 coils in the Bell System today mean thinner wires, more wires in a cable—more economical service for you. They demonstrate once more how Bell Telephone Laboratories work continually to add to your telephone's value.

BELL TELEPHONE LABORATORIES

WORKING CONTINUALLY TO KEEP YOUR TELEPHONE SERVICE BIG IN VALUE AND LOW IN COST

TOMATIDINE—Drs. Erich Mosettig and Yoshio Sato of the National Institutes of Health and Dr. Thomas Fontaine of the Bureau of Agricultural Chemistry examining a bottle of tomatidine in front of tomato plants from which it was derived in a Department of Agriculture greenhouse, Beltsville, Md.

BIOCHEMISTRY

Hormones From Tomatoes

Tomatidine, the non-sugar portion of tomatin, an antibiotic found in the leaves and roots of tomato plants, is the starting point for new discoveries.

➤ THE LOVE apple has finally lived up to its name. This plant, more commonly known as the tomato, can be made to yield sex hormones through chemical processes discovered by scientists at the U. S. National Institutes of Health.

A cheap and plentiful source of cortisone, famous anti-arthritis remedy, may also result from this same discovery, though more research will be needed for this.

Tomatidine is the starting point for the discoveries reported. This chemical is the non-sugar portion of tomatin, an antibiotic, or mold chemical, found in the leaves and roots of common tomato plants. Tomatidine was discovered by Dr. Thomas Fontaine of the U. S. Department of Agriculture.

Process for converting tomatidine into another chemical, called allopregnenolone, was worked out by Drs. Yoshio Sato and Erich Mosettig of the National Institutes of Health and Dr. Alfred Katz, visiting research fellow from the University of Basel, Switzerland.

The pregnenolone compound can be readily transformed into the female hormone, progesterone, and the male hormone, testosterone, by methods already known to pharmaceutical houses that produced these synthetic sex hormones. Converting this starting compound into cortisone has not yet been accomplished though many chemists are working on the problem.

The synthetic sex hormones, it was pointed out, are normally prepared from three compounds: cholesterol, from animal nerve tissue such as brain, stigmasterol from the soy bean plant, and diosgenin from Mexican yams. Stigmasterol and diosgenin, however, do not exist alone in the plants. They must be separated from other chemicals, whereas tomatidine is the only thing in the tomato leaf and therefore can be obtained more easily and simply.

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METALLURGY

Iron Oxide Coating Prevents Rust on Iron

➤ STABLE INSULATING iron oxide coatings for ferrous metals, which also protect against rusting, are made by a heat-treatment process on which a patent was issued last week among the 775 patents granted by the government. Highly resistant, stable insulating films are produced, it is claimed, and they protect the metal from rusting for long periods of time.

Inventors of the process are Paul L. Schmidt, Perrysville, and Lawrence R. Hill, Pittsburgh, Pa. Patent 2,543,710 was awarded to them. Rights are assigned to the Westinghouse Electric Corporation, East Pittsburgh. Their invention is claimed superior to earlier processes of producing insulating oxide surface films because of the stability of the oxide formed.

A heat treatment is the key to the improved process. It was found by these scientists that various ferrous materials may be heated in a selected oxidizing atmosphere within the temperature range of 400 degrees to 570 degrees Centigrade to provide a stable, highly insulative magnetic oxide of iron surface film. The atmosphere used is largely water vapor and carbon dioxide, and it is absolutely necessary that the free oxygen content be less than one-half of one percent.

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WILDLIFE

Wild Life Survives Hottest Forest Fires

➤ SOME of the hottest brush and forest fires do not destroy wild life as completely as you might think.

Rodents, ants and even some birds apparently go below ground or hide in rock outcrops, Dr. Walter E. Howard of the zoology division of the University of California's College of Agriculture, has found. Other birds fly out of the area—but return almost before the ashes cool. Some may survive in "islands" of brush missed by the fires.

Dr. Howard bases his conclusions on a zoological survey taken after a 1600-acre brush fire in Madera County, not far from Yosemite National Park, last summer.

On the morning after the fire, a three-hour count was taken of animals drinking from a spring almost at the center of the burn.

Dr. Howard reported: 321 valley quail of all ages; 31 cottontails (one singed by fire); 12 gray squirrels; 4 ground squirrels; more than 80 brown towhees; 27 California jays; and 18 California woodpeckers.

"In fact," he said, "it was impossible to make a record of all the kinds of birds present."

Science News Letter, March 10, 1951

POPULATION

Must Control Fertility

Asia's teeming millions must be controlled or millions of men, women and children will be doomed to death by starvation.

➤ THE TEEMING millions of Asia must control their fertility if they are to escape simultaneous vast increases in overall population and death by starvation of millions of men, women and children.

These were the conclusions reached by a panel of population experts at the Centennial Conference on Science, Technology and World Resources held by Northwestern University.

Scientific research, industrialization and other factors have led, in the Western world, first to a decrease in the mortality rate and then to a corresponding decrease in the birth rate. Before the birth rate fell, the experts said, there was a vast increase in the population of the West.

However, there are factors in Asia which may not make the pattern there the same. Asia's people now number perhaps three times as many as they did in the mid-seventeenth century.

"To assume a European type transition in mortality and fertility in the future would imply the industrialization and urbanization of the continent and the generation of populations three to six times as numerous as those that now exist before births and deaths were in balance at low levels," according to Irene B. Taeuber of the Office of Population Research at Princeton University.

But Dr. Warren S. Thompson, director of the Scripps Foundation at Miami University, warned that in the East, "only a slightly higher level of living and a modicum of public health work" could send the population up in the next decades.

"The poverty-stricken and crowded peoples of these non-industrialized lands can be raised out of their misery only slowly, Dr. Thompson declared, "even with very liberal assistance from the West, and the factor which will do most to retard the alleviation of their misery is their own birth rate."

Miss Taeuber called for the application of scientific method to fertility and those social and psychological factors associated with it, as well as to mortality and the other components of a population balance.

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METALLURGY

Pinch of Arsenic Improves Lead Covering

➤ A "PINCH" of arsenic added to lead alloys used to cover underground cables carrying electric power gives longer life and greater strength to the alloy, according to a report issued by the University of Illinois. By a pinch is meant one-tenth of one percent of arsenic.

Hundreds of millions of dollars are invested in these underground electric cables. They vary in size up to three inches in diameter, and some carry as high as 130,000 volts. Lead is used for the covering because it is resistant to moisture and corrosion. Both tin-lead and copper-lead alloys are used.

These alloys, however, sometimes develop cracks due to expansion and contraction with changing temperatures. Costly repair work is then necessary because the insulating oil used in the cable escapes.

The arsenic-containing alloy not only adds strength to the electric cables but also permits heavier electrical loads because higher pressure can be used for the insulating oil within them. The benefit of arsenic in the alloys was determined in the university's engineering experiment station by Prof. Curtis W. Dollins.

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GENERAL SCIENCE

Truman Sees STS Group

President tells winners that they should prepare themselves to help in development of neglected areas. We need weapons, not for destruction, but for welfare.

See **Front Cover**

➤ PRESIDENT TRUMAN, in receiving the 40 winners of the Tenth Annual Science Talent Search, set a task for them. He told them that their job was to prepare themselves so as to help develop the potentialities of neglected areas of the world. He urged them to use their talents for peace.

President Truman's Remarks

Following is the text of Mr. Truman's extemporaneous remarks to the high school seniors:

It is a pleasure to me to welcome you here. I hope you will all go through with what you have started, and wind up just as Mr. Davis has said your predecessors have; because the power and welfare of this country is wrapped up in scientific research.

I just had the Atomic Energy Commission in to see me a few days ago, and it is remarkable what they are doing toward making that splintering of the atom eventually work for the peacetime welfare of the world.

You young ladies and gentlemen can make a great contribution to all those things that are associated with scientific research.

I was over at Aberdeen the other day, looking at tanks and weapons and guided missiles, and all the other things which you hear about. And when I got through I didn't then have any feeling of mystery about why the Chinese have not been able to push us out of Korea; because we have better equipment and better weapons.

But the weapons we want are not those for destruction, but weapons for the welfare of the world, and the improvement of all mankind so that we won't have to spend tremendous sums for destruction, but use those tremendous sums for the improvement of the welfare of all the races in the world.

If you will turn around there and look at that globe behind you, you will find that there are many, many places that need development, and that can be developed to make this world a much better place in which to live.

(The President walked over to the "Eisenhower globe" across his office from his desk.)

For instance, down here in the great river systems down here—(indicating the continent of South America)—they have more water than Niagara—a fall that is greater than Niagara. And then there are these lakes up here—(indicating)—whose waters now run out into the Amazon River, and they are going to be diverted for the cultivation of this part of the coast along in here, and give Bolivia a seaport.

And over here, on this plateau, there are 65 thousand square miles of black land, just like Illinois, Iowa and the lower Missouri, six to eight thousand feet above sea level, that will produce anything that can be raised in a temperate zone, although it is almost directly on the Equator. They can raise enough food on that—they don't have any cattle grazing there—to support 100 million people.

And in this place over here—(indicating the continent of Africa)—it can support another 100 million people with developments which have not been carried out. If they could be done in this valley—(indicating)—it will support 25 million people as it did when Babylon and Nineveh were great cities, if irrigation projects were installed.

And all the oil resources of this section here—(indicating)—are greater than any other place in the world. And this country right here—(indicating)—can produce food enough for a hundred million people. Think what that will mean, when the resources up in here—(indicating)—have been developed. Alexander the Great was along in this river—(indicating)—and there are traces of him in Afghanistan. And if the resources of that section were properly developed, 300 million people could be supported.

Now, that is part of your job, to see whether we can get that done or not. And that is the reason I am glad to see you, and hope you will remember what I have told you about that globe when you go back to school, and see what kind of contribution you can make to carrying out the peace and welfare of the world. That is what we are after.

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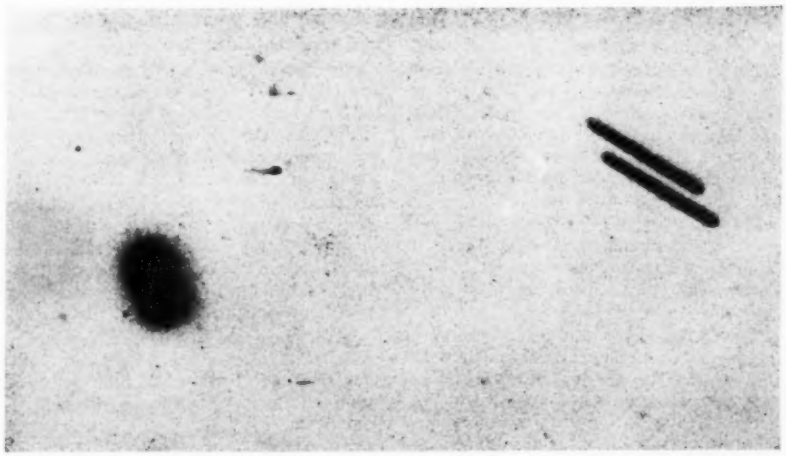
ASTRONOMY

Asteroid Spotted in Pleiades: Orbit Highly Eccentric

➤ A FAINT object, but bright for an asteroid, has been spotted by Dr. William Markowitz of the U. S. Naval Observatory. It was discovered speeding across the Pleiades, bright cluster of stars in the constellation of Taurus, the bull.

The tiny planet was found quite by accident as part of the study of the polarization of light in the Pleiades. Not one but two images of the asteroid appear on the photograph for its light had passed through calcite, a crystal which produces twin images, placed at the focal plane of the 26-inch refractor.

Three observations, enough to determine



TWIN TRAILS—The double image of the recently observed asteroid, Thalia, is due to the fact that it was photographed through calcite crystal which produces twin images. It was taken on the evening of Feb. 24. The double blob at the left is one of the faint stars of the Pleiades. The length of the trail is the result of an hour exposure.

the orbit, were made. The asteroid's path was found to be highly eccentric. The object, of 11th magnitude, was found in a position at right angles to the sun instead of directly opposite the sun, and was moving twice the average speed for that position.

Calculations of the orbit of this minor planet, which some people even guessed might crash into the earth, showed it to be not a new object after all.

It is one of the first asteroids ever discovered, Thalia, Number 23 in the list of these heavenly bodies that now numbers over 1,600. To Dr. Leland Cunningham, of the University of California, goes credit for pinning on the once-puzzling object its true identity. Dr. Cunningham's calculations showing that the object was Thalia were confirmed by Dr. Paul Herget, director of the Cincinnati Observatory.

And Thalia, astronomers point out, is not expected to crash into the earth.

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GENERAL SCIENCE

STS Group Enrich Leisure

Small orchestra could be assembled from the 40 winners but there are not enough for a team in any one sport. Many have worked at serious scientific jobs.

➤ YOUNG scientists are busy people. The activity lists of the 40 who have been selected as this year's most promising, show dozens of hobbies and out-of-school interests.

Science, of course, is number one on their list. They do it individually in their own laboratories and collectively in science clubs. Most of them are affiliated with Science Clubs of America which conducts the Science Talent Search each year.

Almost all have worked in science far beyond the high school curriculum. A fair share have studied college courses in science on their own or with interested adults. They use after-school hours for experimentation but have to reserve extensive undertakings like building a TV set, qualifying for a radio license or collecting in the field to the summer months.

Young scientists are interested in more than science, however. They take part in activities common to all 'teen agers. Social and civic enterprises are listed by each and they have their share of memberships and offices, indicating leadership and popularity with fellow students.

For many of them athletics have been crowded out by music. A small orchestra could be assembled from the 40 but no varsity team of any one sport could be gathered.

Ten of the 40 play the piano with varying degrees of excellence. Wind instruments they can play include the cornet, three clarinets, saxaphone, flute, tuba and harmonica. For the string section they can provide a cello, string bass, three violins and a guitar. One plays all kinds of percussion instruments. Most of them sing and all profess a fondness for listening to music.

In sports most of the 10 girls and 30 boys enjoy games and athletics but usually on the intramural level. Very few have had time or inclination to practice to major team proficiency. Those who have made varsity teams are skilled in soft ball, table tennis, swimming, tennis, track and wrestling.

Like most scientists, the 40 winners are attracted to the precision as well as the beauty of music and generally approach athletics for the relaxation rather than the competition of it. They favor individual or small group sports.

A majority of the 40 have worked for pay during vacations and after school hours. Their jobs are similar to those held by other 'teen agers; they deliver papers, mow lawns, jerk sodas, baby sit, caddy, clerk, work on farms and assist in libraries.

A few of the winners have advanced to the stage in their careers when they can command and fill positions of real scientific importance. For example:

Miss Rhea Mendoza, 16, of Kew Garden Hills, N. Y., worked last summer with the New York Association for the Blind as a volunteer reader and research assistant. She was assigned to read to post graduate students in science.

Stephen Brush, 15, of Orono, Maine, spent last summer as a clerk with the Agricultural Economics Department of the University of Maine. His assignment required calculating and recording records of potato and milk production in that state.

John J. Demkovich, Jr., 17, of New Brunswick, N. J., is the junior assistant to the City Chemist of that city. John assists in milk testing, using chemical and bacteriological skills.

Miss Mary Helen Martin, 17, of College Park, Md., is a botany laboratory assistant at the University of Maryland. She germinates and checks pepper seeds for polyembryos (twins), takes chromosome counts, doubles haploids with colchicine and makes controlled crosses of plants.

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GENERAL SCIENCE

STS Winners Have Plan for National Service

➤ THE FORTY top winners of the Tenth Annual Science Talent Search are generally agreed that it is in the best interests of national defense to utilize the talents of potential scientists at the highest levels possible.

All high school seniors, they expect to serve their country—both the young men and the young women—but they think they would be more useful to the Defense Department or to essential industry after they receive college degrees.

John J. Demkovich, Jr., 17, declared that: "All boys and girls who will graduate in June owe a debt to their country; this debt could be met by drafting all students into the armed forces for four months. After this training period is completed, all young people who wish to, could be offered a chance to take an aptitude test to determine whether or not they have special abilities which might be used in scientific or other essential occupations."

Mr. Demkovich saw this plan as providing an adequate number of scientists and professional men, as well as meeting the requirements of the armed forces.

These 40 were picked out of thousands of others in the Tenth Annual Science Talent Search administered by Science Service and supported by the Westinghouse Educational Foundation.

Donald Bruce Johnson, 17, El Cerrito, Calif., said: "Everyone must work where he is most needed whether he likes the job or not."

But he pointed out that the only way the United States can gain physical superiority in the present world conflict is through the use of superior methods and equipment. To do this, he declared, we must take the best advantage of our scientific talent. He suggested that those with scientific skills be given an opportunity to serve in a scientific capacity, but declared that they must be prepared to do jobs that are unpleasant or hazardous.

The young women have ideas of service, as well. Sixteen-year-old Rhea Mendoza, Kew Garden Hills, N. Y., said that all persons with scientific aptitudes and skills should sign up at a correlating center so that their special abilities may be directed where they are needed in an emergency. She too stressed the need to continue the education of younger scientists, "with an eye toward long-range need for trained personnel rather than the immediate desire for a large armed force."

Several of the students stressed the need for keeping a cool head during times of emergency and combatting hysteria.

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ENTOMOLOGY

Glowing Clothes Repel

Experiments in Canadian forest show that luminescent satin is less attractive to mosquitos than other materials. Insects are also drawn to dark colors and perspiration.

➤ YOU CAN shop now to foil next summer's mosquitos. To keep them from attacking you, buy luminescent satin clothing. The pests are considerably less attracted to this material than to others tested for their drawing power.

Two robot dummies, dressed to resemble men and placed six feet apart in a Canadian forest furnished this and other valuable information on what to wear to be the least—or the most—attractive target for mosquitos.

Dr. A. W. A. Brown, zoologist at the University of Western Ontario, London, Canada, conducted the mosquito attraction tests for Canada's Defense Research Board and Department of Agriculture.

Next to luminescent satins, plain satins drew less than either broadcloths or crepes. Woven nylon clothing was considerably less of a lure than cotton shirts and drill trousers.

The drawing power was measured by counting the number of landings made by mosquitos in one and two-minute periods on the dummies. The robots were two stainless steel tanks, containing 100 pounds of water electrically heated to body or other desired temperature. For most of the tests Dr. Brown dressed the dummies in a crepe jerkin and a felt shirt. A head was added if necessary to test the effect of exhaling different gases.

Only one-tenth to one-quarter as many mosquitos alighted on the dummy dressed in white as on the one dressed in black. This was true no matter how light it was during the tests.

Green was less attractive than red or blue, and light reds and blues were less than half as attractive as the darker shades of the same colors. When dark shades of blue and red were compared red was more tempting to the mosquitos. However, light blue proved to be more of a drawing color than pink.

If the temperature is more than 60 degrees Fahrenheit and your clothes are wet, you will probably attract two to four times as many mosquitos as with dry clothing, according to the tests on the dummy. On the other hand, when the temperature is lower than 60 degrees and there is a lot of moisture in the air, dry clothing is twice as apt to attract mosquitos as moist.

As for lure of odors to mosquitos, a jerkin wet with human perspiration proved to have almost twice as much pull as a clean jerkin with an equal amount of moisture.

Clothing soaked with water that had been saturated with carbon dioxide presented no more allure to the pests than normal wet clothing. If, however, carbon dioxide was passed through the dummy's head at a rate and concentration equivalent to normal exhalation, the drawing power of both the head and body was raised 50%.

When pure carbon dioxide was "exhaled" by the dummy, twice as many mosquitos were lured to the body and three times as many to the head. The fumes of ether and of gasoline were also found to be attractive, whereas those of chloroform were significantly repelling to the mosquitos.

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AERONAUTICS

Tiny Fast New Plane Studies Speeds Near Sound

➤ A TINY airplane to explore flight conditions at speeds approaching that of sound is under construction by the Northrop Aircraft, it is now revealed. It is 20 feet long from nose to tail, and has a wingspan of 25 feet.

It might be called a "flying laboratory" because it is packed with scientific measuring instruments, including many developed by the National Advisory Committee for Aeronautics to give stability and control. Space for the pilot is reduced to a minimum to provide room for all the instruments.

The plane is being built for the U. S. Air Force, and will be known as the Northrop X-4 research airplane. It is a lance-shaped craft, with a long pointed nose and a vertical tail piece. It has sweptback wings with square, instead of pointed, ends.

Its jet engines hug the fuselage on each side at the bases of the wings, with air-scoops to the right and the left of the pilot. Special construction is used in body and wings to provide safe housing for the many instruments the plane will employ.

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MEDICINE

If Whale Hunting Were Popular, We'd Have ACTH

➤ IF WHALE hunting were as popular today as in the time of "Moby Dick" and the famous 19th century whalers, we might have more ACTH for painful, crippled arthritic joints.

This famous pituitary gland hormone has been obtained from whale pituitary glands, five Norwegian scientists report to NATURE, (Feb. 17). The five are Finn Boe, Hugo Holtermann, Sigbjorn Salvesen, Karl Fr. Stoa and Arne Sverdrup of the research department of Nyegaard and Co., Oslo.

Whale pituitary glands being considerably larger than the hog pituitaries from which most ACTH is now obtained, this would be good news but unfortunately there are not many whales and they are not hunted as much as formerly. Also the necessary freeze-drying of glands immediately after removal from the whale presents other practical difficulties.

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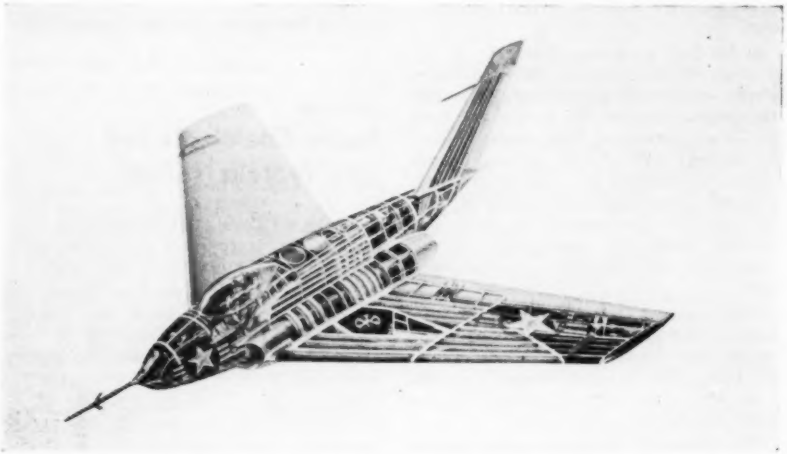

RESEARCH PLANE—20 feet in length and built for the U. S. Air Force, this little plane, shown here cut away, has space for many recording instruments and will be used to study flight conditions at high speeds.

INVENTION

Nails Can Be Used With New Concrete

➤ A CONCRETE into which nails can be driven as into wood, and which resists withdrawal to the same degree that wood does, is made of portland cement, the mineral known as vermiculite, and vitrified clay granules. It is the vermiculite which is flexible enough to yield and receive the nails.

Vermiculite is a mica-like material, found in several places in the United States, now widely used in lightweight concrete and plaster. It has the property of expanding by heat-treatment to a permanent volume some 15 times its volume as mined. It is this expanded mineral that is used in the nailable concrete.

Patent 2,542,992 was granted to Lyle Clapper, University City, Mo., for this invention. One-half the patent rights are assigned to Leon B. Schumacher, Kirkwood, Mo. Particularly claimed is its ability to accept a nail, without bending, driven into it with an ordinary hammer, and without chipping off concrete adjacent to the nails.

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PHYSICS

Man-Made Vacuum Is Far from Ideal

➤ EVEN the best man-made vacuum is far from being the scientist's dream of "nothing at all surrounded by a glass bottle."

Prof. E. N. da C. Andrade, director of the Royal Institution, finds that a reasonably good vacuum, such as you might find in the glass lining of a thermos flask, still contains enough air molecules so that if they were apportioned among all the inhabitants of the earth a pint of such vacuum would supply each person with 1,000 molecules.

At his best, man can achieve a vacuum so empty of gas molecules that its pressure is only one ten-million-millionth of normal atmospheric pressure. To picture just how small that pressure is, Prof. Andrade drew the analogy that if the normal 30-inch column of mercury in a barometer were stretched to the height of Mt. Everest, then on that scale the pressure in man's best vacuum would be represented by one twenty-fifth the thickness of a cigarette paper.

Prof. Andrade then deflated this achievement of human vacuum makers by pointing out that the pressure in Nature's vacuum, which fills the space between the stars, is one ten-million-millionth lower still than man's best effort.

The physicist's effort to create emptier and emptier vacuums might seem "a great deal of fuss about nothing," Prof. Andrade said, but in reality vacuums have most important and commercial applications.

Without the relative emptiness of high vacuum for them to travel through, it would be impossible to spin sub-atomic particles around at atom-smashing speeds in such machines as the cyclotron, betatron and synchroton. Another important application of high vacuum is in the freeze drying of blood plasma so that the plasma can be stored safely in powder form to be ready for any emergency.

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PHYSIOLOGY

Struggling Helps You Survive in Icy Water

➤ YOUR chance of escaping alive after being dumped into icy water from an airplane or boat is better if you swim or struggle as hard as possible for as long as possible. To try to preserve your strength by clinging to wreckage or floating on a lifebelt is the wrong method.

This advice on how to keep from dying in cold water is offered by Dr. E. M. Glaser of the Medical Research Council. Before and during various swimming activities, as well as while at rest, he tested the body temperature of a man swimming in cool—about 65 degrees Fahrenheit—water.

His results, nevertheless, apply to icy conditions. This is because the amount of body heat produced has been found to be independent of the water temperature when there is no shivering.

A man who is swimming hard produces about as much heat as he loses in water near freezing and he should not die of cold as long as he can swim. Also, muscles being exercised hard may remain warm enough to keep them from becoming stiff, Dr. Glaser reports in NATURE (Dec. 23), British scientific journal.

After rescue, a man who has been swimming would not require warming of his arms or legs at the expense of more important parts of his body.

Science News Letter, March 10, 1951

NUTRITION

Radio Chemicals Tell How Protein Is Used

➤ RADIOACTIVE CHEMICALS are helping scientists learn more about how dairy calves utilize the protein in their feed.

Digestion and absorption of casein, the chief protein of milk, starts very quickly, G. P. Lofgreen of the University of California's animal husbandry division reports from such studies.

Casein digestion continues for 24 hours, in contrast to the short time required for fat absorption. And phosphate exchange goes on at a high rate in the omasun, one of the three stomach compartments of the calf and other ruminants.

Science News Letter, March 10, 1951

IN SCIENCE

METALLURGY

Corrosion Is Studied By Electric Method

➤ CORROSION, including rusting, is being measured as it takes place at the Illinois Institute of Technology by a method that picks up the minute electrical currents created by the chemical reaction, enabling scientists to measure and study the process.

Corrosion, of which rusting is an example, is caused by thousands of local cells similar to microscopic flashlight batteries The electrochemical cells are formed by corrosive chemicals and the metal itself, Dr. Howard T. Francis of the Institute's staff explains.

By studying the action of these tiny, unwanted electrical cells, electrochemists can learn more of the fundamental facts regarding corrosion. From this knowledge, more effective controls may be developed.

In the process, a metal cylinder is used as the laboratory sample on which corrosion occurs. This cylinder is dipped in some corrosive solution, such as sea water, rotated several hundred times a minute, and scanned with a stationary probe electrode.

The probe is a plastic arm containing 11 silver wires. In use it is placed very close to, but not touching, the submerged cylinder. It picks up the minute electrical currents caused by corrosion and carries them through an amplifier to observation and measuring devices.

Science News Letter, March 10, 1951

DENTISTRY

More Children With Green Teeth Predicted

➤ MORE and more small children with bluish green baby teeth may be seen in the future, predicts Dr. Gertrude Tank, Philadelphia dentist, in a report to the JOURNAL OF THE AMERICAN DENTAL ASSOCIATION (March).

The bluish green teeth can result from the kind of jaundice babies get because of Rh blood trouble. And since more and more babies are being saved from Rh blood death, more of them will be showing up with the bluish green teeth.

Dr. Tank reports details on two such children, a boy and girl, not related, who were brought to the Community Health Center at the age of four. It will be "interesting," Dr. Tank observes, to see whether the first permanent molors which begin their enamel and dentin contact at birth will come through green in color.

Science News Letter, March 10, 1951

ENCE FIELDS

RESOURCES

Oysters Transplanted To Chesapeake Bay

➤ MORE oysters for your dinner table are expected from transplantation studies being made at Solomons, Md.

Baby oysters have been taken up from their original home in South Carolina and transplanted to Chesapeake Bay, where it is hoped they will grow successfully this coming season.

A major problem in Maryland oyster culture is the production of sufficient seed oysters to meet the needs of planters. In South Carolina waters, the difficulty is exactly opposite: Oysters set in such great numbers as to cover up and crowd out the large oysters, thus cutting down on the quality of the final product.

So biologists of the Chesapeake Biological Laboratory and of the Bears Bluff Laboratories in South Carolina are testing out a trade—growing some of the extra South Carolina seed in the Chesapeake Bay.

Plantings have been made under various conditions and scientists are now watching the beds to see how the transplanted oysters will thrive.

Science News Letter, March 10, 1951

INVENTION

Midget Fish-Finder Developed for Anglers

➤ A MIDGET version of the sounding equipment used by commercial fishing boats to locate underwater fish will soon be available to pleasure boat anglers. Like its big brother, it sends high frequency sound waves from the boat to the bottom of the ocean. It receives and records the reflected sound waves.

Anything in the water which has a greater density than the water itself will cause a reflection. This includes fish. This small version, developed by the Pacific Division of Bendix Aviation Corporation, has a valuable feature which makes in chart form a detailed picture of reflecting objects beneath the boat.

This baby model weighs only 14 pounds, is about the size of a small radio receiver and can be mounted in any boat. It operates off storage batteries if necessary because it uses no more current than a 40-watt electric light bulb: It has a depth range up to 50 fathoms.

The electric current is used to produce electrical impulses which in turn are converted into high freqeuncy sound waves. The sound wave sending device is usually attached to the bottom of the huil of the vessel but with the new instrument can be placed on the inside bottom of the boat, transmitting its signals through the wood.

The primary use of the instrument from which the midget version was developed is in taking soundings of the depth of the ocean or other deep water. Its use is called echo-sounding. The depth of the water is determined by the time required for sound waves to travel from a point near the surface to the bottom and back to the starting point.

Science News Letter, March 10, 1951

PHYSIOLOGY

Demand for Brightness Puts Strain on Child

➤ THE DEMAND put on children to be very intelligent puts a strain on even bright youngsters, Dr. Bruno Bettelheim, psychiatrist of the Orthogenic School of the University of Chicago, told the meeting of the American Orthopsychiatric Association in Detroit.

At this special treatment school, an attempt has been made to provide conditions of living that will bring mentally and emotionally disturbed children back to health. In so doing, much has been found out about the strains that cause children to break.

It was realized, Dr. Bettelheim told his colleagues at the meeting, that the problem of preventing mental illness is not just one of helping the child to meet the demands put upon him by life. Certain features of life which stand in the way of mental health must also be changed, he indicated.

Other "middle class" values besides the high regard for intelligence are obstacles to mental health, Dr. Bettelheim said.

Science News Letter, March 10, 1951

METEOROLOGY

Nation To Be Wet Until End of March

➤ THE NATION is going to be wet during March. The Weather Bureau's Extended Forecast Section predicts mild weather with frequent showers in the East and cool, wet weather in the Far West.

Only exception is the Southeast, where precipitation will not exceed normal amounts.

The dividing line for the country, according to the bureau, will be the Continental Divide. East of the divide, temperatures will average warmer than normal for March, and west of the Divide, it will be colder than normal.

There will be more than normal amounts of rain over all of the nation except the Southeast.

Science News Letter, March 10, 1951

PSYCHOLOGY

Wolves and Dogs Act Somewhat Like Humans

➤ WOLVES and dogs show certain similarities to human beings in basic behavior patterns, Dr. J. P. Scott, director of the division of behavior studies of the Roscoe B. Jackson Memorial Laboratory, finds.

The behavior pattern similarities show up particularly in connection with a long period when the offspring are dependent on parents.

For successful domestication, Dr. Scott suggests that a high degree of development of patterns of social behavior plus considerable similarity in these patterns to those of human beings is necessary.

Dr. Scott's findings are reported in a publication of the New York Academy of Sciences.

Science News Letter, March 10, 1951

TECHNOLOGY

Straw Used for Boxes, Replacing Wood Veneer

➤ STRAW can serve as a raw material for boards to make boxes, replacing critical wood veneer, the Technical Association of the Pulp and Paper Industry was told.

Drs. E. C. Lathrop and T. R. Naffziger of the Agriculture Department's Northern Regional Research Laboratory at Peoria, Ill., developed the straw box board in cooperation with E. R. Stivers and co-workers of the Stapling Machines Company of Rockaway, N. J.

The new board-making process uses standard equipment, and the thickness of the board can be varied from one-sixth to one-quarter inch, depending on the type of box needed. Demand for wood veneer, now used in making wire-bound shipping containers, is increasing for other uses.

Science News Letter, March 10, 1951

MEDICINE

Hospital Staff Will Be Walking Blood Bank

➤ A "WALKING BLOOD bank" for use in case of atomic attack is being set up at the Presbyterian Hospital, New York, Charles P. Cooper, president, stated in his annual report of work at the Columbia-Presbyterian Medical Center.

The walking blood bank is the blood flowing through veins and arteries of the hospital personnel. All of them are now being blood-typed, so they can be called on in emergency. In addition, the hospital has purchased stocks of plasma and all medical supplies in big enough quantities to carry on until the American Red Cross or Army can take over.

Columbia-Presbyterian Medical Center, Mr. Cooper said, is equipped to handle from 30,000 to 40,000 casualties.

Science News Letter, March 10, 1951

GENERAL SCIENCE

Basic Science Needed

Practical developments are based on fundamental knowledge, but during the war inquiry into laws of nature had to be laid aside. Science is a collective endeavor.

By HENRY DeWOLF SMYTH

Member, U. S. Atomic Energy Commission

Address delivered at the Awards Banquet of the Science Talent Institute in Washington, D. C., March 5.

➤ THE young men and women who are here this evening to receive awards in the fields of science have had many congratulations showered upon them during their visit in Washington. I hope it will not overtax their patience to have me add my congratulations to the others. Ingenuity, intelligence and industry exercised in an atmosphere of tolerance and cooperation have made this country great. These qualities are exemplified in the work of the young award winners here tonight. I am happy to take part in honoring them and in commending them for the qualities of mind and character they have shown. I would also like to congratulate them on the field in which they have chosen to work. Science will always offer a challenge to intelligence and imagination. Today, however, the circumstances of a scientific career in this country are very different from what they were thirty or forty years ago. It may be helpful to these young people and it may well be worth while for all of us to review both the strength and the limitations of science in the world today, and to discuss what it means to be a scientist in this country in the middle decade of the 20th century.

We should consider both aspects of modern science; basic science and applied science, or technology. Basic scientific research is motivated solely by a desire to understand the laws of nature; in such work possible utility is irrelevant as a motive however important it has proved to be as a consequence. In applied science, the driving motivation is practical utility; the objectives are structures, machines, or processes of practical value to mankind; here understanding the laws of nature is irrelevant as a motive although increasingly important as a method. Both branches of science are essential to our progress.

In the past fifty years there has been a great change in the methods by which we improve our technology. Fifty or a hundred years ago, most machines and processes came from simple inventions. They were developed by men working for a specific objective without very much knowledge of the general laws of nature. In short, these men were inventors and not scientists. They were effective in developing a great number of mechanical devices, for our early inventors, even if they lacked formal education, were more or less familiar with mechanical laws through common experience. Some useful machines continue to be made by inventors of this type, but by and large the growing importance of chemical and electrical processes and the great complexity of even our mechanical machinery today have forced our technology to depend more and more on engineers and scientists who have had a thorough grounding in the natural sciences. Men who are designing industrial machines today may need to understand such abstract subjects as thermodynamics, the theory of relativity, and quantum mechanics. The difference in motivation between basic science and applied science remains, but the difference in method is no longer clear. So-called "useless" research has turned out to be often extremely useful research. If we are interested in continuing technological progress, we must continue to support basic scientific research, for if we do not have further discoveries in basic science today, we shall have no developments in technology tomorrow. Even in a period of emergency like the present, we must continue to inquire into the laws of nature because the better we understand these laws, the better we are able to make them work for us and through them to devise machines or weapons that may, in hard fact, be necessary for our survival as a free nation.

Especially Important Now

Actually, it is even more important at the moment for us to encourage basic science than it was before the war, for during the years 1941 through 1945 basic science came to a halt in this country. In these war years, we used all available scientists from our universities and government laboratories on immediate war technology drawing heavily on our reservoir of basic knowledge. Furthermore, in the last fifteen or twenty years, the gap in time between developments in fundamental research and the final development of practical machines has almost disappeared. The result is that today we have no backlog of basic science from which to draw new technological developments. What we are developing in technology today depends on the basic research of the nineteen thirties. It is important that this be understood and that universities, foundations, and government itself give full support to fundamental research, even when we cannot see where this kind of research will lead. The man who spends his time asking so-called "idle" questions about the laws of nature may be more important to this country in the near future than the worker in applied science who develops a new device or a new weapon based on the principles discovered twenty years ago.

Collective Endeavor

Science, increasingly in modern times, is a collective activity. Every scientist stands on the shoulders of his predecessors. He must know what others have done before him and he must also know what his contemporaries are doing and thinking. Furthermore, it is now frequently necessary for him to work from day to day as a member of a team. Apparatus and problems are often now so complex as to require simultaneously the combined efforts of several men. In the general sense, scientific progress has always been a collective effort. It is now frequently so in a detailed sense. This poses a real problem for both scientists and scientific administrators. Originality will continue to be the most important trait a scientist can have. It must be valued and preserved. But the personal eccentricities that often accompany it can be very destructive of teamwork. Individual scientists must now learn discipline in their method of work as they have long disciplined their thinking. On the other hand, administrators of science will find that a scientific group which is easy to manage is probably unimaginative to the point of mediocrity. The chief criterion of excellence must remain intellectual power and achievement.

Science substitutes knowledge and understanding for superstition and fear. Over the centuries it has shown us again and again what can be achieved by reason and cooperation, by men working together in an atmosphere of disciplined freedom. This is historically the strength of science and has not changed since the days of Copernicus or Darwin. We must keep this strength.

Today science has become essential to the defense of a free society, and to the further growth of that society. The same qualities of free inquiry, free criticism, ingenuity and enterprise that make it possible for science

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to give us new machines, new medicines and new weapons also are essential for growth in every other aspect of our national life. Science and freedom are mutually dependent. But there is one limitation: No man and not even the Congress can change the laws of nature. Spending a billion dollars will not change these laws although it may help us to make use of them. We must not expect startling developments overnight in our necessarily slow efforts to understand how nature works. According to current headlines, a quick expenditure of millions of dollars will give us almost overnight airplanes that will fly eighty times around the earth without refueling or submarines that will cruise indefinitely on a teacup of atomic fuel. Such exaggerated statements render no service to science or to the country.

Makes One Humble

Perhaps it is just as well that every new development requires long and painstaking study. Such study is apt to make a man humble, and humility is the beginning of wisdom. But one could wish that this fundamental limitation of science were more widely understood in this country.

What does it mean to be a scientist in the middle of the 20th Century? In his most recent book, Science and Common Sense, President Conant of Harvard has said: "Whether we like it or not, we are all immersed in an age in which the products of scientific inquiries confront us at every turn. . . . Therefore, every American citizen in the second half of this century would be well advised to try to understand both science and the scientists as best he can." This seems to me wise advice, so let us consider what the choice of a career in science will mean to a young man or woman in the years ahead of us.

Not Afraid of Work

The fact that you young people have won the awards which you are receiving tonight suggests that you are not afraid of hard work and study, and that you have some measure at least of ingenuity and originality. If you intend to follow a career in science, it is well that you like to work hard and to think. As in any other career involving intellectual effort, you will find a great deal of drudgery; you will not be doing always what you think you would like to be doing; you will not have brilliant or original ideas week by week or month by month. Certainly, you will never have valuable ideas unless they are made against a background of well-ordered information and thorough knowledge of your field. Once that knowledge is acquired, you will still find that there is a great gap between having an idea and demonstrating its value either in experimental or theoretical work. The path between the conception of an idea and its realization is long and arduous, but there is one compensation—it is seldom boring.

Whether a scientist is engaged in basic research or in applied technology, he will face certain conditions of work in the next two or three decades of this disturbing century. The only assumption we can reasonably make about this period is that it will be one of tension, nationally and internationally. We may not have to fight a full-scale war. We profoundly hope that we shall not. But we know now that we must prepare to resist aggression with all our strength for the foreseeable future. We shall have to increase greatly the armed forces of this country and we must use our material resources and our skilled manpower in the wisest possible way. In every aspect of civilian life, the first concern of each citizen must be the long-range value to the country of what he is doing. In the period ahead of us, no citizen can be deferred from national service in this sense. A young man using his skill in a laboratory may well be of more value to his country than if he were in uniform. The wise use of our manpower must be our first concern.

Ability Must Have Wise Use

The award winners here tonight, like other young men of their age across the country, will be asked to spend something over two years in military training after they have reached their eighteenth birthday. Whether or not transfer to college for promising students will shorten this training period remains to be decided by the Congress. I hope such a plan will be worked out, for the only criterion that should guide us is the wisest use of each man's ability. I believe this country faces dangers so great that we can no longer afford to waste manpower and resources as we have done in the past. We shall maintain the free society of the West only if we are cooler, cleverer and more skillful than our enemies, and only if we use the manpower and resources at our command with foresight and judgment. Young men have a right to ask of us, their elders, that they be wisely used. But they also have an obligation to serve where they are asked to serve. Two years of military training may be a valuable experience for a young man. It may teach him a good deal about human relations and the world he will live in. It need not necessarily be time wasted, even for a soldier who intends to be a student. If he will keep a sense of proportion and a sense of humor, his military training may in some ways have values comparable to the first two years of a general college education. Do not misunderstand me. I am not saying that being in the armed forces is preferable to being in college; I am merely saying that it isn't as bad as it is made out to be, and that military discipline does have certain values.

After military service, or its equivalent, is over there are certain conditions that a scientist in this country must expect to find in the next ten or twenty years. I can assure him, especially if he goes into university work, that he will not be wealthy—but then, in the next twenty years probably nobody else will be either. Wealth has never been a major incentive for men of inquiring minds. They do not particularly seek it and they are seldom impressed by it. A scientist must also expect to be considered a little peculiar because he obviously likes to think. His habit of questioning everything about him, and of always being willing to try new ways of doing things, rather than the conventional way, will probably bring down on his head the dark suspicion that he is a radical. In science this kind of unconventionality has brought every advance we have, but the scientist must remember that relations among human beings are very different from the clear objectivity of science, and far more complex, and that there are many factors present in fields outside his own that he cannot evaluate fairly unless he gives them an equal amount of study. Scientists are often called naive in public affairs, but I think it would be more accurate to call them incurably optimistic about human relations outside their own field because they had such success with human relations inside their own field. Experience has taught them that men working together in a spirit of mutual tolerance

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and cooperation can achieve miracles, and they are impatient to carry this great experience into other fields. This is a natural enthusiasm, but it needs to be tempered by patience and wisdom.

In the next twenty years a scientist, whether in or out of government, must expect to work under limitations of secrecy in almost every branch of science. These limitations on discussion, publication and free interchange of ideas are, of course, opposed to the whole tradition of science and will inevitably hamper its growth. Our constant effort must be to limit secrecy to those areas where it is necessary for national safety and to remove it as quickly as we can from all other areas. This involves constant review and revision, and is today one of our most important responsibilities. In the future, government will need increasingly men who understand both the values of science and the realities of the political world. I believe that scientists in the next twenty years will play a far more important role in government than ever before, and I hope they will accept government service if they are asked to do so.

Integrity Vital

As we prepare to defend this country and our allies against the possibility of aggression in the period ahead of us, we must all remember that no country is stronger than the integrity of its individual citizens. Because scientists are more apt to have access to secret information than other groups, they must be even more conscious of this fundamental truth. The scientists of this country are a high-minded, intelligent and loyal group of men and women. Thousands of American scientists have had and still have access to secret information upon which the safety of this country depends, and daily these scientists fully understand the nature of this public trust. It is very rarely indeed that a scientist fails to carry into public life the integrity that is the hallmark of his profession. All Americans, no matter what their occupation, will need to remember in the period ahead of us that no possible excuse can exist for a man to break his word of honor. If he does not believe in the objectives of the society for which he works, he is free to criticize those objectives, but he is never free to betray them. Criticism is a very different thing from betrayal and this again is something all of us will need to remember as we stand firmly for defense of our constitutional rights at the same time that we work for the defense of our country.

There are many thoughtful men who are frightened by the developments of modern science. I do not share that fright. Those who work in modern science know that it is based not only on objective analysis but also on originality of mind and on cooperation, tolerance and integrity. All scientists depend on the work of their predecessors and progress through the cooperation and honest criticism of their colleagues, criticism which is instantly accepted if it is valid. Men and women have of course developed these same qualities in other fields. I believe that if men are intelligent enough to create mathematical formulae, airplanes, radios, and atomic weapons, they are also intelligent enough to learn how to live together. I believe we will achieve this, and not be destroyed by the tools we have made. I hold firmly to my conviction that we are greater than our tools. For this reason I believe that the prize winners here tonight will ultimately practice their profession in an era of peace.

As scientists in the second half of the 20th Century, you will have an opportunity to join that happy company of men who have felt a compulsion to inquire, to understand, to interpret, and to create. Such men, whether artists, scientists or statesmen, have enriched the vigorous and free society that is our heritage. You will know the pleasure of thought, the exhilaration of building a structure of logic based on established facts and under the discipline of inexorable laws. You will test your ideas by experiment, or see others test them. You will know what it is to struggle through a problem alone and suddenly find the truth as if by revelation. To use your mind in this way is one of the great experiences of life. I hope that each of you who have won these awards tonight will share in this experience.

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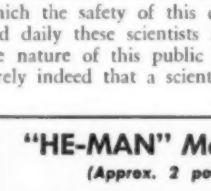

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MEDICINE

Germ Chemicals Heal

➤ SUCCESSFUL use of two chemicals from hemolytic strep. germs to speed healing of infected wounds is reported by Drs. Joseph M. Miller, Milton Ginsberg, Raymond J. Lipin and Perrin H. Long of the Johns Hopkins School of Medicine (JOURNAL, AMERICAN MEDICAL ASSOCIATION, Mar. 3).

Drs. Miller, Ginsberg and Lipin are also associated with the Veterans Administration Hospital at Fort Howard, Md., where the patients were treated.

The two chemicals are called streptokinase and streptodornase. They act to liquefy blood clots, pus and other waste products produced in certain types of infections and injuries. Removal of this material from infected and wounded areas is necessary for healing and growth of healthy tissue.

The strep. chemicals do not act like antibiotics to check the growth of disease germs, but they may be used with antibiotics if these are needed.

Bedsores, rectal infections, amputated stump infections, pilonidal cysts with abscesses, soft tissue infections and collections of blood in the chests were the types of conditions treated.

Science News Letter, March 10, 1951

GEOLOGY-PHYSICS

Earth Structure Studied

➤ THE PULL of the sun and the moon on the earth should provide new knowledge about how the earth is constructed.

As the moon moves around the earth and the earth around the sun, the gravitational forces they exert are different in different parts of the world. But these variations are often greater or less than would be expected merely because of the positions of the moon and sun.

Studies carried out in Honolulu and on the California coast show variations about 132% of that which should be expected from a theoretically rigid earth, Dr. Louis B. Slichter of the Institute of Geophysics of the University of California at Los Angeles reports (SCIENCE, Feb. 23).

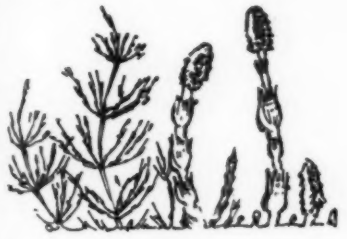
The earth, under the crust, may be stiffer at some points than at others, accounting for the difference. Or there may be other reasons connected with the earth's structure which causes these variations.

The variations will be investigated further to see whether they give any clues as to what the inside of the earth is like.

Science News Letter, March 10, 1951

BOTANY

NATURE RAMBLINGS



BOTANY

Horsetails

➤ ONE of the most interesting of outdoor sights, when late winter is hesitating on the verge of the first frosty week of spring, is a bed of the spore-bearing shoots of the horsetail or scouring rush, pushing its way up into the chill air in a wayside ditch.

There is something eldritch, gnomelike, about these stiff, leafless, jointed stems, each bearing at its summit a symmetrical little cone marked off with what look like even, six-sided scales.

As a matter of fact, the other-earthly appearance of the horsetail is not inappropriate, for the horsetails we see are the relics of an earlier earth. They are the last roses of a very long geological summer. They are among the oldest of all the plants, and in the heyday of their tribe, during the Coal Age, they were giants with trunks a foot in diameter and 50 feet or so in height.

As has often happened in the course of geological history, the big members of the tribe fell first in the face of changing climatic conditions and the competition of newer species of plants, leaving the meekest of their kind to inherit the earth, or at least so much of it as the newer vegetation would spare them.

The horsetail is one of the very few living plants that can trace an unchanged ancestry so far back. Virtually all the other genera that lived during that remote time have utterly disappeared, or have left descendants so modified that they could hardly be recognized as the off-shoots of their ancestors.

We may get some idea of its antiquity when we reflect that since its first modest appearance on the earth all of its giant compeers, the club-moss trees and seed-ferns of the coal age, have passed away; that the whole vast array of flowering plants, together with all modern ferns and mosses, have appeared and developed; that the empire of the dinosaurs rose, flourished and fell; that all reptiles, birds and mammals have come into being, and that compared with the horsetail, Man is a mere child of yesterday.

The plants get their name, horsetails, from the bristly, much-branching, non-fruiting stalks of some of the species, which do have a more or less superficial resemblance to the jointed tail of an animal. The Latin name, Equisetum, is almost the exact equivalent of the English.

Their other name, scouring-rushes, comes from their usefulness as pot-cleaners, in old-time kitchens. Long before the modern much-advertised scouring pads and powders ever reached the market, the stems of these humble vegetables made copper and tinware bright. The interesting thing about it is that the harsh stiffening of the scouring-rush's stem and the effective scraping flakes of the scouring powder are both made of the same chemical substance—silica.

Science News Letter, March 10, 1951

CHEMISTRY

Lignin Used in Rubber Manufacture

➤ THE RUBBER soles on shoes may soon be made partly from rubber, partly from a wood product now going to waste.

Lignin, one of the two main compounds in wood, can replace carbon black, a finely-divided form of carbon now used in manufacturing rubber. The lignin-rubber products, so far made only for test purposes, have properties just as good as, and in some cases better than, those made with the usual rubber and carbon black.

Use of now-discarded lignin with rubber to make such items as shoe soles was foreseen by Dr. J. J. Keilen of the Polytechnic Institute of Brooklyn, who described studies on rubber-lignin mixtures to members of the American Chemical Society. W. K. Dougherty and W. R. Cook of the West Virginia Pulp and Paper Co., Charleston, S. C., assisted in the work.

The supply of carbon black is now tight and is expected to become much more critical in the coming months. Lignin is available in quantities up to about 2,000 tons a year. This is from two to four times the amount of carbon black now used by the rubber industry.

Lignin-rubber mixtures will not be used for tires for awhile yet, however. There are still some properties of the combination that have to be ironed out for tire use, Dr. Keilen warned.

Science News Letter, March 10, 1951

● RADIO

Saturday, March 17, 1951, 3:15-3:30 p.m. EST

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Victor R. Boswell, Division of Fruits and Vegetable Crops and Diseases, Agricultural Research Administration, Beltsville, Md., will discuss "New Seeds for New Crops."

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THE AMERICAN EPHEMERIS AND NAUTICAL ALMANAC FOR THE YEAR 1952—Nautical Almanac Office—*Govt. Printing Office*, 654 p., $3.75. New edition of the standard reference work.

THE BED-LOAD FUNCTION FOR SEDIMENT TRANSPORTATION IN OPEN CHANNEL FLOWS—Hans Albert Einstein—*Govt. Printing Office*, Tech. Bull. No. 1026, 71 p., paper, 65 cents. Technical bulletin of the Department of Agriculture on river basin development. 10 work charts included.

BRIEF COLLEGE CHEMISTRY—Leon B. Richardson, *Henry Holt*, Rev. ed., 470 p., illus., $4.25. Revision of author's 1942 textbook for introductory general chemistry courses.

CABOCHON JEWELRY MAKING—Arthur and Lucille Sanger—*Bennett*, 128 p., illus., $3.50. A how-to-do-it book on stone setting and design for the hobbyist who knows how to use hand tools.

CONTEMPORARY HOUSES: Developed from Room Units—*Small Homes Council, University of Illinois*, 62 p., illus., paper, $1.00. A report on architectural investigation in house design making use of improved building techniques.

CYTOGENETICS OF THE GROUSE LOCUST *Apotettix Eurycephalus* Hancock—Robert K. Nabours and Florence M. Stebbins—*Kansas Agricultural Experiment Station*, 116 p., paper, free to those seriously interested upon request to publisher. Technical bulletin No. 67.

ELECTRIC CIRCUITS FOR ENGINEERS—Edward J. Kraybill—*Macmillan*, 212 p., illus., $3.85. A textbook for engineers in all related fields.

EVOLUTION AND CLASSIFICATION OF THE OSTEOSTRACI AND THE EXOSKELETON OF EARLY OSTEOSTRACI—Robert H. Denison—*Chicago Natural History Museum*, 58 p., illus., paper, $1.00. Discussions of some of the earliest known vertebrates from the Fieldiana Geology collection.

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FILM DISCUSSION GROUPS IN FUNDAMENTAL EDUCATION—Peter Brinson—*Olen Press*, approx. 14 cents. Fifth in an educational series prepared with UNESCO.

THE FIRST BOOK OF NURSES—Mary Elting—*Franklin Watts*, 42 p., illus., $1.75. Narrative style information for young reader about all kinds of nurses.

GEOGRAPHY OF THE PACIFIC—Otis W. Freeman, Ed.—*Wiley*, 573 p., illus., $10.00, school edition, $8.00. Thirteen experts—geographers, anthropologists and area specialists discuss the ocean, the islands, the people, the resources; the human relationships, the political development, and current problems of the Pacific.

GEOGRAPHY OF THE USSR: A Regional Survey—Theodore Shabad—*Columbia Univ. Press*, 584 p., $8.50. An up to date picture of the entire area within the USSR limits at the end of 1950. A total of 55 maps show about 4,000 place names mentioned in text.

HANDBOOK FOR SERVICEMEN—Parnell Callahan —*Oceana*, 64 p., paper, $1.00. Answers questions arising through transition from civilian to serviceman to veteran.

HOW TO STOP SNORING—David Horwich—*Exposition*, 80 p., $2.00. Simple psychological principles applied to snore control, for the snorer and the snored to.

AN ILLUSTRATED LABORATORY MANUAL OF PARASITOLOGY — Raymond M. Cable — *Burgess Publishing Co.*, 152 p., illus., paper, $2.25. Revised edition of teacher's manual first prepared in 1940.

INTERLINGUA-ENGLISH DICTIONARY—Alexander Gode, Ed.,—*Storm*, 315 p., $5.00. A dictionary of 27,000 words of common pattern in the languages of the Western civilization. Practical aid to teacher of modern foreign languages.

INTERNATIONAL COUNCIL OF SCIENTIFIC UNIONS: Report of Proceedings of Fifth General Assembly—F. J. M. Stratton—*Cambridge Univ. Press*, 249 p., about $1.05. Report of assembly at Copenhagen, September 14 to 19, 1949.

INTRODUCTORY QUANTITATIVE ANALYSIS: Principles and Selected Procedures — Ernest H. Swift, *Prentice-Hall*, 534 p., $5.25. Text for two-semester course with laboratory procedures and methods.

KON-TIKI—Thor Heyerdahl — *Rand-McNally*, 304 p., illus., $4.00. To support a theory that the South Sea Islands were peopled by "immigrants" from Peru, six men crossed the Pacific on a primitive raft in a 101-day journey.

KOREA AND THE UNITED NATIONS—*United Nations (Columbia Univ. Press)*, 96 p., paper, 25 cents. A history of debates and actions of the Security Council in the Korean question from June 25 to September 7, 1950. Includes a chronology from 1945 to the aggression.

LAND HUNGER IN MEXICO—Tom Gill—*Charles Lathrop Pack Forestry Foundation*, 86 p., illus., $2.00. A study of the interrelationship of the people of Mexico and their basic natural resources.

LANGUAGE, TRUTH AND LOGIC—Alfred Jules Ayer—*Dover*, 160 p., $3.00. Revised edition brings up to date the author's 1936 antidote to muddled thinking and communication.

MAKING AND USING PEANUT BUTTER—W. R. Beattie—*Govt. Printing Office*, 15 p., illus., paper, 5 cents. Bulletin of the Department of Agriculture on commercial and home making of peanut butter. Food values and recipes included.

MECHANICS OF MATERIALS—Harry D. Conway—*Prentice-Hall*, 325 p., $6.35. Text with theoretical examples applicable to practical problems.

METHODS AND COSTS OF PRODUCING ALCOHOL FROM GRAIN BY THE FUNGAL AMYLASE PROCESS ON A COMMERCIAL SCALE—*Govt. Printing Office*, 38 p., paper, 15 cents. Bulletin of the Production and Marketing Administration and the Bureau of Agricultural and Industrial Chemistry of the Department of Agriculture.

METHODS OF OPERATIONS RESEARCH—Philip M. Morse—*Technology Press and Wiley*, 158 p., $4.00. New mathematical techniques applicable to industry, government, and military, for predicting and understanding future operations and modifying them.

MOST OFTEN NEEDED 1951 TELEVISION SERVICING INFORMATION—M. N. Beitman, Ed.—*Supreme Publications*, 192 p., illus., paper, $3.00. Fifth manual in Television Series for technicians.

A NATURALIST IN THE GRAN CHACO—Sir John Graham Kerr,—*Cambridge Univ. Press*, 235 p., illus., $4.50. Extracts from diaries of two famous expeditions by the author in 1889-91 and 1896-7 to an area almost completely unknown to science.

PARASITIC INFECTIONS IN MAN—Harry Most, Ed. —*Columbia Univ. Press*, 229 p., $4.50. A symposium of the Section on Microbiology of the New York Academy of Medicine. For microbiologists and allied laboratory and clinical investigators.

PATTERNS OF SEXUAL BEHAVIOR—Clellan S. Ford and Frank A. Beach—*Harper*, 307 p., $4.50. Study similar to the Kinsey report, but based on studies of sexual patterns of 90 representative societies from the Arctic to the southern tip of Australia. Foreword by Robert Latou Dickinson.

THE PHASE RULE AND HETEROGENEOUS EQUILIBRIUM—John E. Ricci—*D. Van Nostrand*, 505 p., $12.00. Textbook for advanced students of chemistry.

THE POLAROGRAPHIC METHOD OF ANALYSIS—Otto H. Muller—*Chemical Education Publishing Co.*, 2d ed. 209 p., illus., $3.50. Revised and augmented text for teachers and students.

POWER TOOLS AND HOW TO USE THEM—W. Cyde Lammey—*Pop. Mechanics*, 144 p., illus., $2.50. A guide to what tools to buy for the home workshop, how to use them, and what to make with them.

PRINCIPLES AND PRACTICE OF BACTERIOLOGY—Arthur H. Bryan—*Barnes & Noble*, Rev. ed., 410 p., illus., $1.75. Modernized and revised fourth edition of one of the college outline series.

PRINCIPLES OF PHASE EQUILIBRIA—F. E. W. Wetmore and D. J. LeRoy—*McGraw-Hill*,

$3.50. Textbook presenting basic principles of heterogeneous equilibria in terms of laboratory criteria.

PROPAGATION OF SHORT RADIO WAVES—Donald E. Kerr, Ed.—*McGraw-Hill*, 728 p., illus., $10.00. Volume 10 of Massachusetts Institute of Technology Radiation Laboratory Series.

THE PUBLIC HEALTH NURSE IN YOUR COMMUNITY—Public Health Service—*Govt. Printing Office*, 14 p., illus., paper, 10 cents. Tells how public health nurses help maintain good health in home, school, and work.

QUIROGA: A Mexican Municipio—Donald D. Brand—*Govt. Printing Office*, 242 p., illus., paper, $1.75. Prepared in cooperation with the State Department, this study is the outgrowth of two research projects in southwestern Mexico begun by the Smithsonian Institution in 1939 and concluded by this publication. A detailed study of a Mexican community.

RADIOACTIVE TRACERS IN BIOLOGY: An Introduction to Tracer Methodolgy—Martin D. Kamen—*Academic Press*, 429 p., illus., $7.50. Second edition of 1928 text brings various aspects of tracer techniques up to date.

RESEARCH FOR INDUSTRY—*Armour Research Foundation*, 52 p., illus., paper, free upon request to publisher. Annual review and report.

A REVISION OF FOSSIL SEQUOIA AND TAXODIUM IN WESTERN NORTH AMERICA BASED ON THE RECENT DISCOVERY OF METASEQUOIA—Ralph W. Chaney—*American Philosophical Society*, 91 p., illus., $1.50.

SCIENCE NEWS, No. 18—J. L. Crammer, Ed.—*Penguin Books*, 144 p., illus., 35 cents. Latest in series of British papers.

SEMIMICRO QUALITATIVE ANALYSIS—William Lloyd Evans, Alfred Benjamin Garrett and Harry Hall Sisler—*Ginn*, 240 p., illus., paper, $3.00. Revised textbook bringing up to date the author's earlier work on elementary qualitative analysis. Exercises and questions included.

TEN RIVERS IN AMERICA'S FUTURE—Water Resources Policy Commission—*Govt. Printing Office*, 801 p., $6.00. Detailed and comprehensive studies of plans, potentialities and problems of development in 10 major river basins. Volume two of the Commission's Report to the President.

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Science News Letter, March 10, 1951

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RADIO

Mobile Radio Probes To Aid Predictions

➤ A RADIO sending and receiving station on wheels has started probing the outer layers of the earth's atmosphere. The object is to improve long range radio communications.

The spot near Cincinnati chosen for the probing studies is half-way between the National Bureau of Standards' transmitting station at Sterling, Va., and a corresponding station operated by Washington University at St. Louis. It is directly under the predicted point in atmosphere where the radio beam between Sterling and St. Louis is bent back towards the earth.

Trailer trucks carry all the equipment needed to transmit, receive and record radio signals. Called the "St. Louis Equipment," the operation will enable scientists to explore for the first time the electrically charged upper atmosphere at the midway point.

From 50 to 200 miles above the earth's surface there are a series of electrically conducting layers known as the ionosphere. Radio waves of certain frequencies are reflected back to earth by the charged air. They are thus received many miles from their source.

Sunspots and the seasons among other factors affect the ionosphere, often making necessary a change in radio station frequencies for best reception. From studies at this and other midpoint locations, enough should be learned about the propagation of radio waves in the ionosphere to map their paths accurately and improve communications.

Science News Letter, March 10, 1951

INVENTION

Soil Fumigant Applied In New Capsule Form

➤ AN IMPROVED method of putting pest-killing chemicals into the soil is provided by the use of an insecticide capsule on which patent 2,543,580 was issued to Wallace G. Kay, Grosse Pointe Park, Mich. The capsule coating is slowly dissolved by the moisture in the soil, releasing vapor from the chemicals to kill particularly nematodes and wireworms but also insects and their larvae.

The capsules are dropped in holes made by a stick, and then covered with soil. The fumigant is released only after an interval of time, so that poisonous fumes that come to the surface can do no injury to the user. With certain fumigants applied below the surface without the capsule, users sometimes are required to wear gas masks.

Science News Letter, March 10, 1951

PHOTOGRAPHY

Three Dimension Photos Soon To Be Available

➤ COMMERCIAL photographers will soon be able to make three-dimensional pictures with an adaptation of the military trivision system announced by its inventor, Douglas F. Winnek. In an earlier invention of his, single X-ray pictures are obtained that show length, breadth and depth.

A new lens, suitable for use in standard illustration or portrait cameras, is employed. The inventor states that it can "look" around the scene to capture all dimensions. The image is recorded upon the ordinary film or plate. A lenticular, or lens-like, plastic screen, which remains in the film or plate holder, resolves the image into a trivision negative. With present equipment, the photographer can make as many prints as desired.

Science News Letter, March 10, 1951

Nearly every large passenger liner wherever it may be in the world can now be reached by *telephone*.

Good *soil management* means the efficient production of quality crops along with continued improvement in soil productivity.

MISTAKES IN SCIENCE
How Many of These Common Scientific Fallacies Are You Guilty of Believing?

Do you believe that the general theory of relativity has been "proved"—and that the arguments upon which it is based are accepted in toto by all reputable physicists? Do you believe that it is possible to give an accurate portrayal of experience by means of mathematics? Do you acknowledge as "established fact" the dimensions of the universe given to us by cosmogonists? Do you accept uncritically all judgments of time, space, wave mechanics, matter, etc., made by modern science? Let outstanding scientist P. W. Bridgman (winner of the Nobel Prize in Physics) point out the error in these beliefs in his brilliant, searching THE NATURE OF PHYSICAL THEORY. Put your own thinking on a firmer basis by learning to distinguish scientific truth from scientific hogwash. Stimulating, objective appraisals and descriptions of the contributions of Newton, Bohr, Einstein, Heisenberg and others. "A wealth of illuminating and thought-provoking observations. It should be read by anyone interested in physical science."—**American Physics Teacher.** Send only **$2.25** for your copy to DOVER PUBLICATIONS, Dept. 23, 1780 BROADWAY, N. Y. 19, N. Y. Return book in ten days if unsatisfactory for immediate refund. Only 150 copies left so tear out this ad (or write name and address on separate piece of paper) and mail TODAY.

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❁ *HAIR TRIMMER, recently patented, is a short-tooth comb-like device, with an elongation for a handle, made of two flat pieces fitting closely together. Inside is a recess to hold a thin double-edge razor blade which can be adjusted to regulate the cut.*

Science News Letter, March 10, 1951

❁ *IDENTIFICATION camera, usable by an amateur and with which four pictures of the same person can be made in 40 seconds, can be easily set up in any part of a factory for the rapid processing of all employees for whom wartime identification badges are necessary.*

Science News Letter, March 10, 1951

❁ *CLOTHES DRYER for apartment tenants consists of two brackets to attach to opposite walls. These are held in place by suction cups. Four lines may be stretched between them, giving hanging space arranged so that drip is into the tub*

Science News Letter, March 10, 1951

❁ *SPIRIT DUPLICATOR, an Army development for producing multi-colored maps and sketches in the field, is hand operated and able to print four colors on paper 22 by 29 inches in size. Alcohol is the dampening medium to transfer the image from master copy to copy paper.*

Science News Letter, March 10, 1951

❁ *LAWN SPRINKLER is rectangular in shape as shown in the picture, and delivers a gentle mist-like spray that will not injure newly seeded surfaces or delicate*

flowers. Made of molded rubber, it is almost unbreakable and can be attached to the hose without a washer. Face plate is aluminum.

Science News Letter, March 10, 1951

❁ *SAFETY HARNESS, for airplane pilots and passengers, has a strap to fit around the body and others to fit around each shoulder. It allows freedom of movement to operate controls but also holds the entire body against the seatback, even during very rapid speed deceleration.*

Science News Letter, March 10, 1951

❁ *ACETYLATED cotton ironing board covers and pads are highly resistant to injury from hot flatirons and are claimed to outlast usual covers five or six times. The material is a chemically treated cotton, under a process developed by the U. S. Department of Agriculture.*

Science News Letter, March 10, 1951

❁ *LENS CLEANER with a silicon base comes in a two-ounce transparent-plastic spray bottle operated by pressing the sides. The cleaner works itself under surface dust and grease, making cleaning easy with a soft cloth and leaving a coating film on the glass.*

Science News Letter, March 10, 1951

Do You Know?

Helicopters have come into use in forestry to spot forest fires.

Honey has long been recognized for its value in infant feeding.

Scientists are developing a dried mixture of *milk and honey* as a valuable food.

During daylight *fogs*, a car with headlights on is visible from two to three times as far as one without headlights.

Cooking utensils made entirely of *stainless steel* tend to become too hot in spots so heat must be kept low to prevent burning food in top-of-stove pans.

Avalanches, which usually follow the same courses, are being prevented in Norway by sturdy fences of timber, rock and iron rods built near their starting points.

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